

NOTES ON THE BIOLOGY OF *CANDALIDES CYPROTUS CYPROTUS* (LEPIDOPTERA: LYCAENIDAE)

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Abstract

The early stages of *Candalides cyprotus cyprotus* (Olliff) are described and figured. Observations of its behaviour are discussed.

The unusual behaviour of the first instar larvae "ring-barking" the flowers of *Conospermum* spp. is described. A suggestion is made that the larvae may be obtaining some substance from the flower pedicels. In this process the flowers are destroyed and more lateral leaves may be produced on the plants which could provide more food for the next generation of larvae.

C. cyprotus cyprotus appears to be strongly associated with *Conospermum* spp. in the coastal heaths and sandy woodlands in the Sydney, Gosford and Hunter regions. This association with *Conospermum* spp. rather than *Jacksonia scoparia* may indicate that they are not conspecific with other populations e.g. *Candalides cyprotus pallescens* (Tite) and even any other populations feeding on *Grevillea* spp.

Introduction

Candalides cyprotus (Olliff), is distributed locally in southern Australia from central Queensland to Western Australia (Common and Waterhouse 1981). One described subspecies, *C. cyprotus pallescens*, is restricted to Queensland and northern New South Wales. The life history of *C. cyprotus* is not fully known but the food plants recorded are *Jacksonia scoparia* R. Br. in Queensland and New South Wales, *Grevillea* sp. at Braidwood, N.S.W. and *Grevillea bracteosa* near Geraldton, W.A. (Common and Waterhouse 1981, Atkins 1984).

Candalides cyprotus cyprotus (Olliff)

The following observations were recorded from populations of *C. cyprotus cyprotus* occurring in coastal dune-heath at Port Stephens, central coast N.S.W.

Foodplant.—*Conospermum taxifolium* Sm. (Proteaceae).

Egg. (Fig. 1).—0.6 mm diameter; pale green, with reticulated pattern of six-sided pits and blunt projections (Fig. 5). Egg hatches in nine days.

Larva.—First instar: length 1 mm; pale yellow-green, covered with numerous long setae. Second to final instar (Fig. 2): length 2 mm to 15 mm; pale green to purplish-green with lateral row of emerald green spots; first three (thoracic) segments with paired dorsal tubercles coloured turquoise at tips; abdominal segments with similar single dorsal tubercles; anal segment with single dark-green dorso-lateral tubercle and single long, blue, distally placed lateral tubercle; body covered with short, dark-brown setae. head, brown, retractable under first segment. Larval duration approximately 8 weeks.

Pupa (Fig. 4).—Length 12 mm; dull black, heavily textured; slightly serrated, paired projections on frons and dorsal portion of thorax. A dorsal projection

of each of the last seven abdominal segments tapered posteriorly and flanged laterally.

Notes.—Adults of *C. cyprotus cyprotus* were observed from August to January but apparently were single-brooded in central N.S.W., the pupal duration being at least nine months. In the Hunter region the butterfly appeared to be absent from woodland areas where *J. scoparia* was abundant.

Males “hilltopped” on sand-dunes in warm sunny weather but females were less frequently seen, preferring to remain at rest in the shelter of vegetation, near groups of *Conospermum* spp. or on the ground in sandy clearings. When active, the female flew strongly a metre or two above the ground, briefly visiting flowers, particularly species of the family Proteaceae.

The eggs were laid singly on the pedicel or peduncle of an inflorescence of *C. taxifolium*. The freshly hatched larvae crawled to a flower and ate portions of the inner surface of the calyx-tube. Later the larvae moved down the plant to eat the leaves. Near the completion of the first instar the larvae returned to the flowers and proceeded to “ring-bark” each pedicel methodically, causing each flower to wither and drop to the ground. Second to final instar larvae fed on the leaves of the plant, stripping all but the mid-rib. They fed mainly in the morning and evening and remained unconcealed on the plant when at rest.

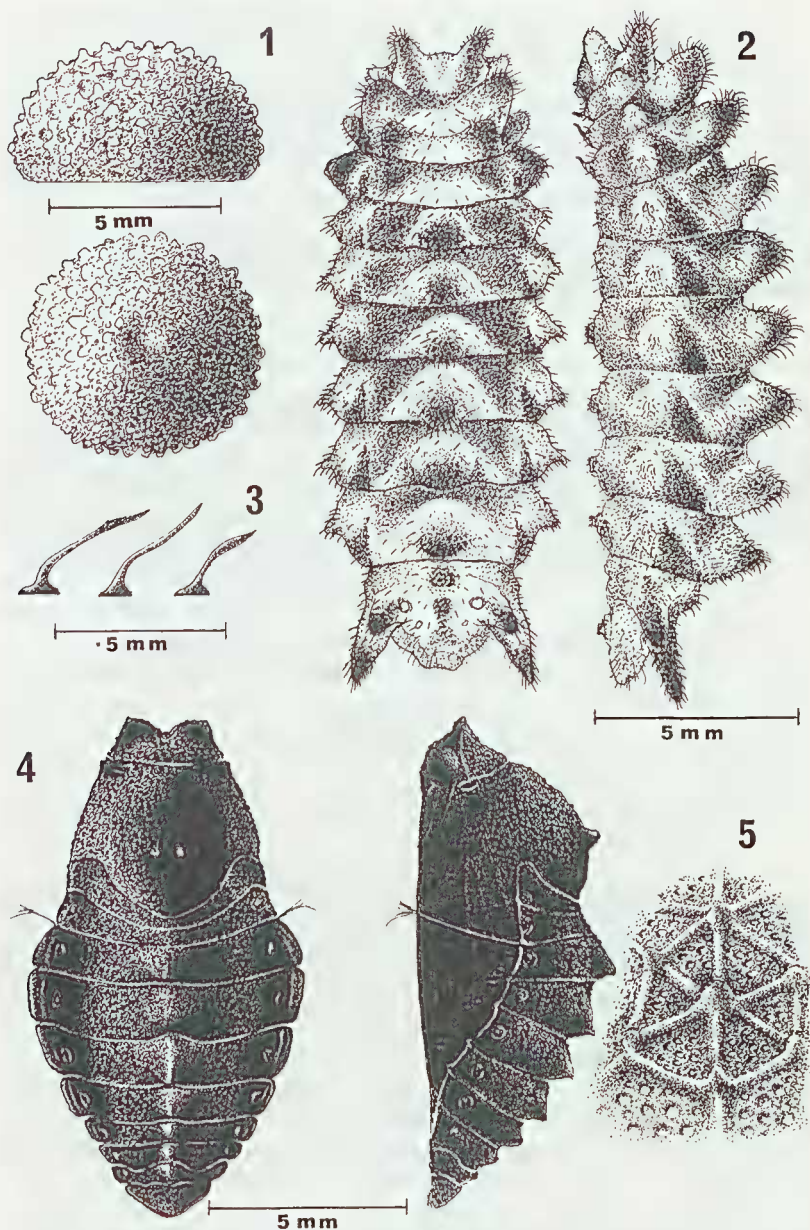
The pupation sites were not recorded in the field, but the dark colour of the pupa and the long pupal duration suggested that concealment was necessary and pupation may occur in debris or leaf litter.

Discussion

The peculiar eating habits of the first instar larva is one worthy of attention. A suggestion is put forward here in an attempt to explain the behaviour. The first instar larvae of this butterfly may require some substance which is only present in the flower pedicels and this may compel them to “ring-bark” the pedicels. Further studies would be required to check this.

The plant may respond by increasing leafy growth. The possible increase in leafy growth may be explained thus; auxin, a plant hormone, is produced in the shoot-tips of plants and is also probably abundant in embryos, young leaves, flowers and fruits. Auxin has been shown (Raven *et al.* 1982), amongst other roles, to have an inhibitory effect in relation to the growth of lateral buds. If the terminal shoot-tip with the apical meristem were removed, the auxin influence ceases, stimulating outgrowth of dormant lateral buds. The plant would renew the shoot system instead of building woody tissues (Harper 1978).

The inflorescence of *C. taxifolium*, a corymbose panicle, is formed at the uppermost leaf-axils. This type of inflorescence is a raceme type which continues to grow in length more or less indefinitely i.e. the apical meristem persists (Rost *et al.* 1979). If the first instar larva of *C. cyprotus cyprotus* “ring-bark” and kill the flowers and terminal shoot, then the influence of auxin would be removed and the lateral shoots would then develop. The possible increased leaf surface area over the whole plant would be beneficial



Figs 1-5. Life history of *Candalides cyprotus cyprotus* (Olliff): (1) egg, lateral and dorsal view; (2) 5th instar larva, lateral and dorsal view; (3) larval setae; (4) pupa, lateral and dorsal view; (5) detail of egg reticulation.

to the larvae of the next generation of the butterfly. This would also require further field studies to determine if this occurs in this case.

C. cyprotus cyprotus appears to be strongly associated with *Conospermum* spp. in the heaths and sandy woodlands of the Sydney, Gosford and Hunter regions. In these areas the butterfly appears to be absent from woodlands containing *Jacksonia scoparia*. This suggests that *C. cyprotus cyprotus* and *C. cyprotus pallescens* and even other populations feeding on *Grevillea* spp. may not be conspecific. Further investigations into the feeding preference, behaviour of the juvenile stages and taxonomic studies of the adults are required to settle this question.

References

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NOTES ON THE DISTRIBUTION OF TWO SKIPPERS (LEPIDOPTERA: HESPERIIDAE) FROM NEW SOUTH WALES

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Abstract

A new locality for *Toxidia andersoni* (Kirby) and *Signeta tymbophora* (Meyrick and Lower) is recorded.

In New South Wales *Toxidia andersoni* is recorded as fairly common in the New England National Park and as rare at several other localities (Common and Waterhouse, 1981). It is also recorded from Mount Allyn, N.S.W. (Wilson, 1984). *Signeta tymbophora* is known from Mount Warning and from Gosford to Mount Dromedary (Common and Waterhouse, 1981).

On 26 and 27 January, 1986 I collected a female *Toxidia andersoni* and four male specimens of *Signeta tymbophora* on North Brother Mountain, near Laurieton, N.S.W. Both species occurred around the edges of a patch of rainforest near the summit of the mountain.

These records represent the most northern known coastal locality for both species.

Reference

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